

NORWICH WATER POWER COMPANY, HEADGATES
West bank of Shetucket River,
approximately opposite Fourteenth Street
Greeneville Section
Norwich
New London County
Connecticut

HAER No. CT-147-B

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, P.A. 19106

HISTORIC AMERICAN ENGINEERING RECORD

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HAER No. CT-147-B

Location: West bank of Shetucket River,
approximately opposite Fourteenth
Street
Greeneville section, Norwich
New London County, Connecticut

USGS Norwich Quadrangle
UTM Coordinates: 18.745890.4602590

Date of Construction: 1882

Engineer: Hiram Cook

Present Owner: City of Norwich, Connecticut
City Hall
Norwich, Connecticut 06360

Present Use: Controlling flow of water into canal

Significance: The headgates are significant as a
major component of a rebuilding of the
Norwich Water Power Company's
facilities in 1882. The project
reduced the length of the canal and
improved the flow of water, thereby
better meeting the needs of the
numerous manufacturers who had located
their factories along the company's
canal. Taken together, the Greeneville
mills represented the largest
concentration of industry in Norwich
throughout the 19th century, and the
water and waterpower provided by the
dam, headgates, and canal were vital to
their operation.

Project Information: This documentation was undertaken in
1994-1996 in accordance with a
Memorandum of Agreement among the
Federal Energy Regulatory Commission,
the Connecticut State Historic
Preservation Office, and the Advisory
Council on Historic Preservation. The
associated dam will be modified to
accommodate a fish passage.

Bruce Clouette
Historic Resource Consultants
Hartford, CT 06106

Description

The headgates for the Norwich Water Power Company canal lie immediately west of the dam's west abutment and are set within a stone and earth bulkhead at the north end of the power canal. The walls of the bulkhead are constructed of a random ashlar of large quarry-faced granite blocks, with six archways for the water passages outlined with carefully cut ring stones. The top of the bulkhead wall is finished with dressed granite coping. In the center of the south elevation is a stone tablet with the following inscription:

BUILT 1882
HIRAM COOK PRES. & C.E.
DIRECTORS
FRANK JOHNSTON
JAMES D. MOWRY
CHARLES P. COGSWELL
HENRY L. PARKER

The six water passageways within the bulkhead measure ten feet square in section.

Extending along the north side of the bulkhead is a single-story gatehouse measuring 100 feet by 14 feet in plan. Built to shelter the mechanisms that lift the sliding wooden gates, the gatehouse is constructed of sawn 4-inch-square timbers, with horizontal nailers for the 6-inch tongue-and-groove board siding that covers the exterior. There are three window openings on the south elevation and two on the north, all of which are now boarded up. The entrance is at the east end of the south elevation, protected by a pent roof and reached by three concrete steps; the operating floor is about 3 feet above ground level. The gatehouse's gable roof is covered with asphalt shingles. The interior is open to the roof, leaving visible the collar ties that connect the rafter ends. A small office area occupies the extreme eastern end.

The six operating mechanisms are set in a row along the north half of the gatehouse floor. The current mechanisms date from 1918 and feature a worm gear that engages with a large gear on the drive-pinion shaft. The gates have two stems, each consisting of two back-to-back timbers fitted with rack gears. The north-facing rack gear is engaged by the drive pinion, while the opposite rack moves against an undriven pinion that acts as a guide. The gates have a lift of about 14 feet. The mechanisms are contained by heavy timber frames braced with iron

rods. They can be operated either by large handwheels on the worm-gear shaft or by electric motors driving a bevel gear on the shaft.

An iron tension rod with a turnbuckle extends from the outside of each operating mechanism frame, near the bearing for one of the guide pinions, to the plate on the gatehouse's north wall. In between each pair of lifters and at the ends of the row is a simple tall timber trestle that extends upward from the mechanisms' sole plate almost to the roof; the trestles are braced with horizontal timbers running between the north and south walls.

Historical Background and Technological Significance

The headgates and gatehouse were built as part of a major reconfiguration of the Norwich Water Power Company's facility in 1882. A new dam across the Shetucket River, approximately opposite Fourteenth Street, replaced its original dam, which had been built in 1829 some 1,200 feet upstream.

There is no direct evidence for the company's motive in undertaking the project, which cost some \$60,000. However, it appears that as originally laid out, the canal did not provide sufficient unrestricted intake flow to meet the demand for water by all the mills that had been built along the canal. The original headgates, the stone parts of which are still visible, provided an opening only about 20 feet in width. Sometime subsequent to 1837, another headgate structure was built immediately west of the first, doubling the width of the intake. However, the benefit of added width must have been partially offset by the indirect path the water took in flowing to the second intake. In contrast, the structure built as part of the 1882 project provided a total of 60 feet of intake width and provided a relatively straight flow of water from the river into the canal. Other reasons for undertaking the project may have been to eliminate problems associated with a long canal, such as retarded flow, water seepage, upkeep, and ice formation. The potential mill sites along the northern end of the canal, which had a relatively narrow embankment, had not been utilized during the first 50 years of operation, so little was lost by bypassing the northern part with a new dam further downstream.

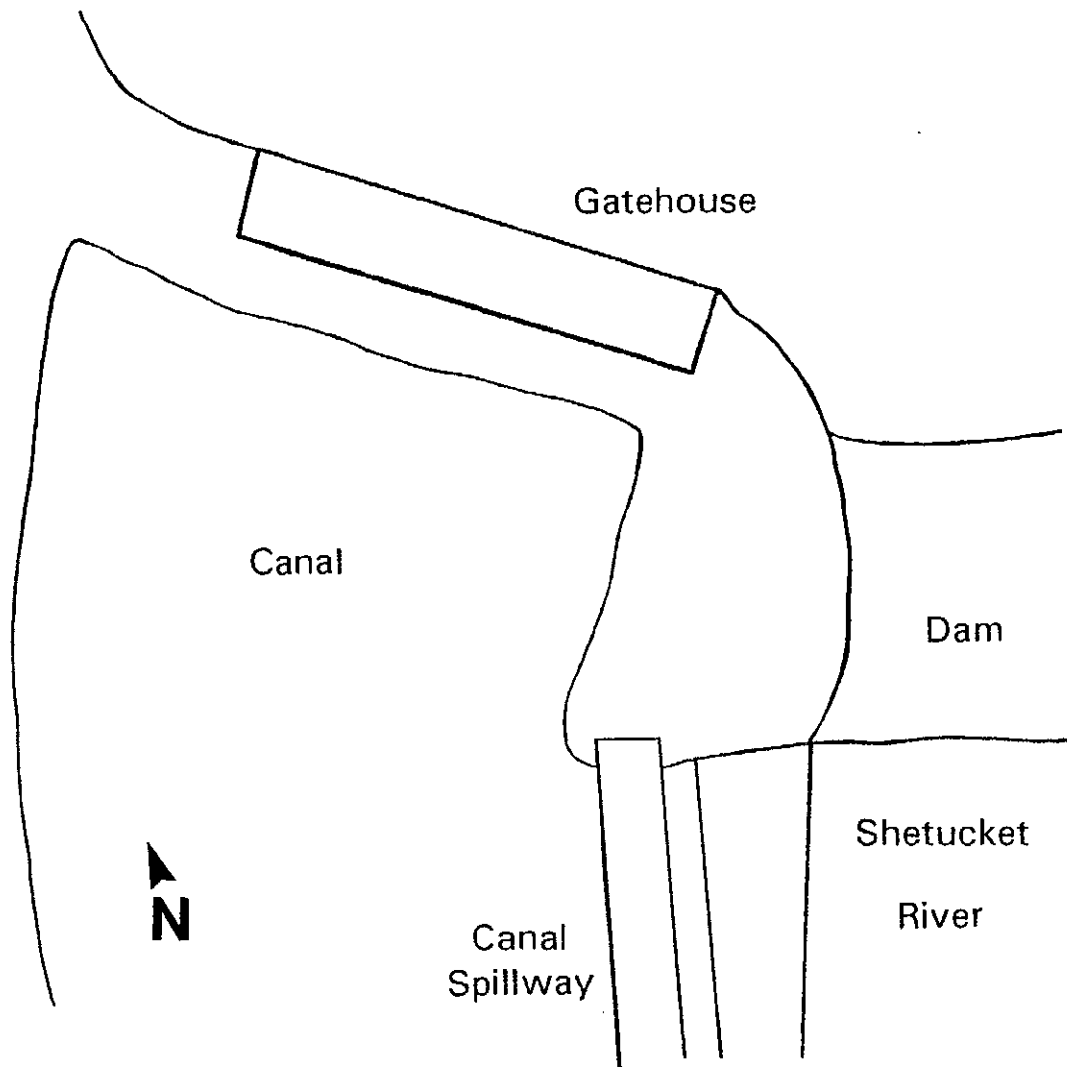
The headgates and gatehouse are typical of 19th-century engineering; similar gates appear throughout New England at textile mills and other waterpower sites. The use of large sliding wooden gates set in masonry channels, rack-gear stems

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(both single and double stems were common), and reduction gearing are all characteristic, as is the provision of a utilitarian enclosure to shelter the mechanisms. The reconstruction of the operating mechanisms in 1918 was one of a series of early 20th-century improvements that also included the reconstruction of much of the dam's timber components and a new canal spillway. Chandler and Palmer, Norwich's leading engineering firm of the period, was responsible for all of these modifications.

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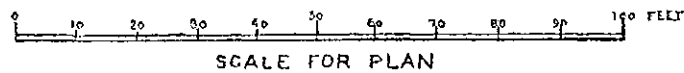
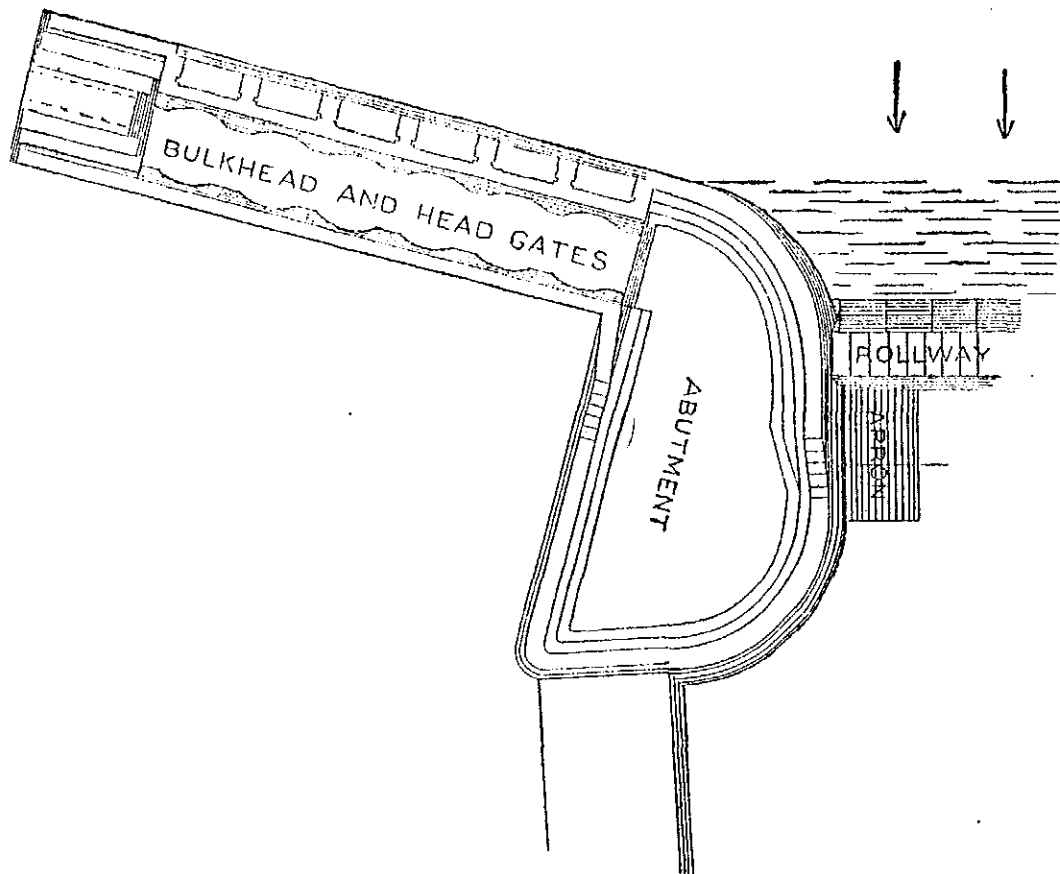
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Site Plan

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View of gate house, looking north, from Art Work of
Norwich (1898)



Plan of headgates, from W. P. Trowbridge (comp.),
Reports on the Water-Power of the United States (1885)